

## IN THE SPECIFICATION

[0006] The steam humidifier burner is supplied with a premix of natural gas and forced air, the gas being supplied under low pressure (less than 1 psi). The humidifier includes a main frame, a movable lower frame coupled thereto, a two part canister for containing water wherein both parts are releasably sealed, ~~a immersed~~ an immersed combustion chamber within which is disposed a radiant gas burner and a heat exchanger coupled downstream of the combustion chamber and gas burner. The heat exchanger is a coil with an upstream end coupled to the combustion chamber and a downstream end mounted through the upper part of the canister. Maintenance is enhanced by having the lower part of the canister coupled to the movable lower frame which enables the lower part to be downwardly withdrawn from the upper part to expose the combustion chamber and the heat exchanger disposed in the canister. Maintenance is also enhanced because each loop of the coiled heat exchanger is spaced apart. By causing relatively rapid thermal expansion and contraction of the coiled heat exchanger, the heat exchanger undergoes thermal shock, which causes scale and debris, adhered thereon, to be released and broken off. The thermal shock results from either activation and then sudden deactivation of the gas burner without water in the canister or activation of the gas burner and sudden flooding of the canister with water substantially simultaneously with the deactivation of the gas burner. A high degree of control and modulation is achieved because the radiant burner is configured for modulated operation from a blue flame mode through a radiant mode.

[0022] The present humidifier 10 has a small foot print. The humidifier is easy to maintain by using an innovative ~~immersed~~ immersed combustion chamber 80 and heat exchanger 20 design.

[00023] The design uses a fully immersed combustion chamber, that is, a combustion chamber 80 substantially fully ~~emerged~~ immersed in the evaporator water. The combustion chamber 80 has a cylindrical shape, mounted to the evaporation reservoir cover 86. The evaporator reservoir 12 is sometimes referred to herein as the humidifier tank or canister. In one embodiment, the combustion chamber 80 is 27.5 inches long and has a 7.5 inch diameter. The top part of the chamber 80 has a removable cover. The bottom part is rounded (FIG. 5) to prevent entrapping steam that would cause overheating of the combustion chamber. An earlier version of chamber 80 used a flat bottom which sometimes resulted in overheating. The combustion chamber 80 is positioned centrally in a cylindrically shaped evaporation tank 12.